UCRL-MI-201375

LLNL Backfit Policy

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November 2003

U.S. Department of Energy

Lawrence
Livermore
National
Laboratory

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This work was performed under the auspices of the U. S. Department of Energy by the University of California, Lawrence

Livermore National Laboratory under Contract No. W-7405-Eng-48.

LLNL BACKFIT POLICY

1.0 Introduction

DOE nuclear facilities are designed, constructed, and operated in a manner to provide for protection of public and worker health and safety as well as of the environment. During the life of a facility, standards used in design, construction, and operation may be revised, or new standards may be issued; however, these new and revised standards generally apply to new design, construction, and operation and do not require modifications at the existing facility. Nevertheless, in certain instances, modifications at existing facilities should be made if safety benefits can be obtained by implementing new or revised standards and the safety benefits justify the costs. Backfitting is the modification of or addition to existing safety structures**,** systems and components (SSCs) identified in the facility's authorization basis document, including associated operations or maintenance procedures, as a result of new or revised standards, where justified. Backfitting shall be considered when analysis demonstrates a substantial increase in the overall protection of public or worker health and safety or of the environment and when the funded costs of implementation are justified in view of the increased protection.

2.0 Applicability

This policy shall only apply to existing LLNL Category 2 and 3 Nuclear Facilities.

Backfitting shall be applicable to those structures, systems, and components designated in the authorization basis document as safety SSCs. Defense-in-depth structures, systems, and components shall be exempt from backfitting, as they are not a primary means of assuring that evaluation guidelines are met nor necessary for worker safety.

Backfit analysis shall be performed when a request has been made by NNSA or the funding program office, the LLNL Change Control Board, the facility Associate Director, or the Facility Manager.

3.0 Standards

LLNL Work Smart Standards, as implemented by Contract 48, shall form the standards used in the backfit process. Part of the analysis to determine the need for backfitting shall focus on changes to an existing facility needed to accommodate new or revised Work Smart Standards.

4.0 Responsibilities

Each Facility Manager shall be responsible for the overall implementation of this policy for their facility.

The applicable facility Associate Director, or designee, shall have final approval authority for backfitting.

5.0 Implementation

The facility Associate Director shall approve a backfit analysis procedure that establishes a multi-level process including analysis, review, and approval. The procedure shall require: a review to identify the safety SSCs affected by the new or revised standards; a gap analysis to identify differences if new or revised standards are implemented; and a determination of potential backfit modifications, compensatory measures, procedure changes, and all associated costs. The procedure shall require consideration of safety benefits, operational changes and impacts, and future facility operation (i.e., lifetime considerations). The procedure shall also require that personnel familiar with the authorization basis and operation of the facility perform the analysis and review the results prior to making a backfit recommendation to the Facility Manager. The Facility Manager shall concur with the backfit recommendation prior to submittal to the facility Associate Director or designee, for their approval or denial.

The facility Associate Director, or designee shall inform NNSA/LSO of the backfit analysis results. Justification shall be provided for the course of action selected. The facility Associate Director, or designee, shall request concurrence from NNSA/LSO prior to the final decision on whether or not to implement backfit modifications.

An LLNL Backfit Analysis Procedure will be developed and shall be used as the basis for developing facility specific procedures.

Backfit Analysis Procedure

1.0 Purpose

This procedure establishes the responsibilities, requirements, and guidelines for performing Backfit Analysis.

2.0 Scope

Backfitting shall apply to all existing LLNL Category 2 and 3 Nuclear Facilities. Backfitting is not applicable to the design and construction of new facilities.

Backfitting shall be applicable to those structures, systems, and components (SSCs) designated in the facility's authorization basis document as safety SSCs. Defense-in-depth structures, systems, and components shall be exempt from backfitting, as they are not a primary means of assuring that evaluation guidelines are met nor necessary for worker safety.

Backfit Analysis shall be used to evaluate new or revised LLNL Work Smart Standards for impact on safety SSCs. The Analysis shall be performed to determine whether there is a basis for design modifications, compensatory measures, or procedure changes to comply with the new or revised standards.

A Backfit Analysis is not applicable to new DOE rules or standards that DOE specifically directs LLNL to implement retroactively. Changes resulting from such requirements shall be implemented through the facility change process.

Backfitting shall be considered when Backfit Analysis demonstrates a substantial increase in the overall protection of public or worker health and safety or of the environment and when the funded costs of implementation are justified in view of the increased protection.

3.0 Definitions

Backfitting - The modification of or addition to existing safety structures, systems and components (SSCs) identified in the facility's authorization basis document, including associated operations or maintenance procedures, as a result of new or revised standards, where justified.

Backfit Assessment Package – Documentation used to record the results of Backfit Analysis.

Backfit Analysis – The process to evaluate new or revised Work Smart Standards, for which DOE has not specifically directed retroactive implementation, to determine whether there is a basis for safety SSC design

modifications, compensatory measures, or procedure changes to comply with the new or revised standards.

SSC Identification – The process to identify safety SSCs and procedures affected by the new or revised Work Smart Standards.

Gap Analysis – The process to identify specific differences in the safety SSC resulting from implementing the new or revised Work Smart Standard. Gap Analysis also identifies differences between existing procedures and changes after implementing the new or revised Standard.

Safety Structures, Systems, and Components (Safety SSCs) – The collection of safety significant structures, systems, or components, and safety class structures, systems, and components for a given facility as defined in the facility's authorization basis document.

4.0 Responsibilities

Facility Associate Director

The applicable facility Associate Director, or designee, shall have final approval authority for backfitting. The facility Associate Director, or designee, shall request concurrence from NNSA/LSO prior to the final decision on whether or not to implement backfit modifications.

Facility Manager

The Facility Manager shall be responsible for the overall implementation of this procedure for their facility. The Facility Manager shall appoint the Backfit Coordinator and members of the Backfit Review Board. The Facility Manager shall approve or deny Backfit Assessment Packages and submit them to the facility Associate Director, or designee.

Backfit Review Board

The Backfit Review Board shall review Backfit Assessment Packages and provide a recommendation to the Facility Manager regarding the acceptance of the package.

Backfit Coordinator

The Backfit Coordinator shall ensure this procedure is applied to the facility. The Backfit Coordinator shall appoint members to the Backfit Assessment Team and shall review Backfit Assessment Packages. The Backfit Coordinator shall ensure that Backfit Analysis is performed when a request is made.

Backfit Assessment Team

The Backfit Assessment Team shall perform SSC Identification, Gap Analysis, Backfit Analysis, and recommend a course of action.

5.0 Procedure

5.1 Appoint Responsible Parties

The Facility Manager shall appoint members to the Backfit Review Board who provide an oversight and approval function for Backfit Analysis activities. Membership is limited, and members are selected based on overall experience, skill mix needs, and facility familiarity**.**

The Facility Manager shall also appoint the Backfit Coordinator who shall have knowledge of the facility's design, authorization basis, and operation.

The Backfit Coordinator shall appoint a Backfit Assessment Team of two or more persons to perform the evaluations and assessments required by this procedure. Members of the Backfit Assessment Team shall collectively possess the following knowledge and skills:

- knowledge of the safety SSCs involved,
- knowledge of the facility authorization basis,
- knowledge of facility operations, and
- familiarity with this procedure.

One of the Backfit Assessment Team members shall be designated as the lead.

5.2 Receive Backfit Request

Backfit Analysis shall be performed when a request has been made by NNSA or the funding program office, the LLNL Change Control Board, the facility Associate Director, or the Facility Manager.

The Backfit Coordinator shall accept the backfit request. The Backfit Coordinator shall ensure the scope of the request is clear, and the Work Smart Standards to be reviewed are identified. The Backfit Coordinator shall direct the Backfit Assessment Team to perform an assessment.

5.3 SSC Identification

The Backfit Assessment Team shall identify and list the safety SSCs affected by the new or revised Work Smart Standard. Using the authorization basis document as a guide, the Backfit Assessment Team shall identify and list the

design criteria, functional requirements, performance criteria, and operational characteristics for the affected safety SSCs.

The Backfit Assessment Team shall also identify and list safety SSC procedures affected by the new or revised Work Smart Standards.

5.4 Gap Analysis

The Backfit Assessment Team shall perform Gap Analysis after identifying the affected safety SSCs and procedures. The Team shall compare the new or revised Work Smart Standard against the existing safety SSCs and procedures.

The Team shall identify differences between existing safety SSC design criteria, functional requirements, performance criteria, or operational characteristics and those of a safety SSC that complied with the new or revised standard. Identified differences shall be listed.

The Team shall also identify and list differences between existing procedures and procedures that complied with the new or revised standard.

The list of differences from Gap Analysis shall be used in performing Backfit Analysis.

5.5 Backfit Analysis

The Backfit Assessment Team shall perform analysis to determine whether there is a basis for safety SSC design modifications, compensatory measures, or procedure changes to comply with the new or revised standard.

Backfit Analysis shall consist of the following steps:

- review each difference from Gap Analysis and determine if adopting the difference would require safety SSC design modifications, implementation of compensatory measures, or procedure changes,
- estimate the monetary cost of implementing safety SSC design modifications,
- estimate the monetary cost of implementing compensatory measures,
- estimate the monetary cost of implementing procedure changes,
- determine the change in accident frequency if safety SSC design modifications, compensatory actions, or procedure changes are implemented,
- determine the change in accident consequences to members of the public, workers, and the environment if safety SSC design modifications, compensatory actions, or procedure changes are implemented.

The Backfit Assessment Team shall make a recommendation regarding implementation of design modifications, compensatory measures, or procedure changes. In making the recommendation, the Team should consider any existing

risk or reliability analyses, operating history, industry and LLNL experience, facility defense-in-depth features, and future use of the safety SSC. In addition, the Team shall evaluate whether potential changes will keep the facility in compliance with the current authorization basis document.

In general, design modifications, compensatory measures, and procedure changes should be implemented when the analysis shows a substantial reduction in facility specific accident frequency and consequences to members of the public, workers, or the environment, and when the cost of implementation is justified in view of the reduction.

The Backfit Assessment Team shall document the basis for their recommendation.

5.6 Backfit Assessment Package

The Backfit Assessment Team shall prepare a Backfit Assessment Package for review and approval. The Backfit Assessment Package shall contain an approval sheet, the results from SSC Identification, the results from Gap Analysis, the results of evaluations performed during Backfit Analysis, the Team's recommendation, and supporting documents.

5.7 Review and Approval

The Backfit Assessment Team shall forward the Backfit Assessment Package to the Backfit Coordinator for review. The Backfit Coordinator shall ensure that the Backfit Assessment Package is complete and that the Backfit Analysis was comprehensive. The Backfit Coordinator shall arrange for a review of the Backfit Assessment Package by the Backfit Review Board.

The Backfit Review Board shall review the Backfit Assessment Package. The Board may accept the recommendation of the Backfit Assessment Team, request additional reviews, or recommend an alternate course of action. The Backfit Review Board shall document their recommendation regarding implementation of the backfit. The Backfit Review Board shall also prioritize implementation if multiple backfits are in progress. The Backfit Review Board shall forward the Backfit Assessment Package and their recommendation to the Facility Manager.

The Facility Manager shall review the Backfit Assessment Package and the recommendation of the Backfit Review Board. The Facility Manager may concur with the Backfit Assessment Package, request additional reviews, or choose an alternate course of action. The Facility Manager shall provide a documented recommendation regarding implementation of the backfit.

5.8 Submittal to the facility Associate Director

The Facility Manager shall submit the Backfit Assessment Package, with recommendation, to the facility Associate Director, or designee. The facility Associate Director, or designee, shall have final approval authority for backfitting.

5.9 Submittal to NNSA/LSO

The facility Associate Director, or designee, shall inform NNSA/LSO of the Backfit Analysis results and final recommendation. Justification shall be provided for the course of action selected. The facility Associate Director, or designee, shall request concurrence from NNSA/LSO prior to the final decision on whether or not to implement backfit modifications.

5.10 Request for Funding

For backfit recommendations receiving concurrence and requiring modifications, NNSA/LSO shall forward a request for funding to the appropriate DOE organization.

5.11 Backfit Implementation

Backfits shall be implemented using the facility's design change or procedure change process.

6.0 Records

Backfit Assessment Packages are controlled documents and shall be retained in accordance with facility procedures